CKM-SERIES
CUSTOMIZABLE KEYPAD

The CKM-Series is a customizable keypad featuring laser etched legends and dimmable LED function lights for each button. The LEDs also provide diagnostics when fault conditions are detected.

With the rugged mechanical packaging (IP69), the CKM-Series can be installed inside or outside the cabin. The low-profile design offers a seamless dashboard look and it can be mounted either vertically or horizontally.

The CKM-Series offers significant advantages over traditional electromechanical switches such as longer actuation cycle (1,000,000), reduced wiring harness and reduced installation time.

Product Highlights:
- NMEA2000® CAN Protocol
- IP69 Front Panel Sealing Protection
- Configurable
- Diagnostic Feedback
- Standard or Custom Laser Etched Legends
- 1,000,000+ Button Actuation Cycles
- Low Current Switching
- 8 to 32V Operating Voltage
- Tactile and Audible Feedback

Model Number:
- CKM12
CKM-Series - Customizable Keypad - Design Features

LOW PROFILE DESIGN
0.57 inch [14.48 mm] thickness (see dimensional specifications for more detail)

SEALING PROTECTION
Fully sealed IP69 front panel

LED FUNCTION LIGHTS
Colors include Amber, Green, Red or Blue.

CUSTOMIZABLE ICONS
Choose from our standard library of icons or use custom icons.

SEALING PROTECTION
Fully sealed IP68 back panel when connected

CONNECTOR
Mates to the Deutsch DT-Series Connector

10-32 MOUNTING STUDS (2x)
Max tightening torque 30 inch lbs.

INTERFACE ADAPTER CABLE
Deutsch to CAN
(Part Number A3703 & A3703-1)

A3703: 39.37 in [1 meter]
A3703-1: 7.87 in [0.2 meter]
# CKM-Series - Customizable Keypad - General Specifications

## Electrical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Voltage</strong></td>
<td>Designed for 12/24 Volt systems</td>
</tr>
<tr>
<td></td>
<td>Minimum 8 VDC</td>
</tr>
<tr>
<td></td>
<td>Maximum 32VDC</td>
</tr>
<tr>
<td><strong>Sleep Mode</strong></td>
<td>Low current sleep mode draws less than 1.5 mA throughout the supply voltage range wakes on keypress or CAN message</td>
</tr>
<tr>
<td><strong>Supply Voltage ratings</strong></td>
<td>The keypad passes SAE J1455 section 4.13.1 for power up, operating voltage, over voltage, reverse polarity, and short circuit</td>
</tr>
<tr>
<td><strong>EMC</strong></td>
<td>Transient immunity: ISO 11452-2, 100 V/m, 20 MHz to 2,000 MHz, Class A per ISO 11451-1</td>
</tr>
<tr>
<td></td>
<td>Conducted Transient immunity: ISO 7637-2:2004, Annex A Table A2 (for 24V systems), Class A</td>
</tr>
<tr>
<td></td>
<td>ESD immunity: ISO 10605:2001, Test level IV (8 kV direct discharge, 15 kV air discharge)</td>
</tr>
</tbody>
</table>

## Environmental

<table>
<thead>
<tr>
<th>Condition</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal</strong></td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td><strong>Solar Radiation</strong></td>
<td>IEC 60068-2-5, procedure B, 10 cycles, Total irradiation per cycle = 22.4 kWh/m²</td>
</tr>
<tr>
<td><strong>Low pressure</strong></td>
<td>IEC 60068-2-13</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>Soak: IEC 60068-2-78, 93% RH (+3%), 10 days</td>
</tr>
<tr>
<td><strong>Cyclic</strong></td>
<td>IEC 60068-2-30, test Db: Damp Heat Cyclic (12hr + 12hr cycle), variant 1, 6 cycles</td>
</tr>
<tr>
<td><strong>Ingress Protection</strong></td>
<td>IP6k9k per ISO 20653 (front side) IP6k8 per ISO 20653 when connected (back side)</td>
</tr>
<tr>
<td><strong>Shock and Bump</strong></td>
<td>IEC 60068-2-27, Shock 500 m/s² 11 milliseconds, Bump 400 m/s² 6 milliseconds 600 cycles</td>
</tr>
<tr>
<td><strong>Drop test</strong></td>
<td>IEC 60068-2-31, Free fall, Procedure 1, 1000 mm height, drop in all 3 axes in both directions</td>
</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>IEC 60068-2-6, Swept sine wave section 8.2, 5 - 500 Hz 20 cycles 5g acceleration</td>
</tr>
<tr>
<td><strong>Chemical Resistance</strong></td>
<td>IEC 60068-2-74, Class B, Engine oil, Diesel, Hydraulic oil, Ethylene Glycol, Urea Nitrogen, Liquid Lime, NPK Fertiliser, Ammonia, Calcium Chloride, Brake fluid</td>
</tr>
<tr>
<td><strong>Corrosion Resistance</strong></td>
<td>IEC 60068-2-52, Test Kb, Severity level 4</td>
</tr>
<tr>
<td><strong>Weathering/Cracking Resistance</strong></td>
<td>ASTM D1171-99, method A, 72 hours</td>
</tr>
<tr>
<td><strong>Abrasion/Wear Resistance</strong></td>
<td>40 cycles of ASTM F2357 testing with 0.25” paper at 175 grams of force</td>
</tr>
</tbody>
</table>

## Mechanical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Dimensions</strong></td>
<td>See Dimensional Specifications</td>
</tr>
<tr>
<td><strong>Panel cutout</strong></td>
<td>See Dimensional Specifications</td>
</tr>
<tr>
<td><strong>Endurance</strong></td>
<td>Each button functions for at least 1,000,000 total actuations (100,000 actuations at -40°C, 100,000 actuations at +85°C, and 800,000 actuations at +25°C ± 10°C)</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAN Protocol</strong></td>
<td>CAN 2.0b type interface as defined by NMEA2000®</td>
</tr>
</tbody>
</table>

*Manufacturer reserves the right to change product specification without prior notice.*

GPS-0007 Rev: A
CKM-Series - Customizable Keypad - Keypad and Icon Artwork Ordering Scheme

Ordering Scheme: Part 1 (Keypad)

<table>
<thead>
<tr>
<th>CKM</th>
<th>1 Series</th>
<th>1A</th>
<th>2 Styling</th>
<th>3A</th>
<th>3 Button Layout</th>
<th>4 Orientation</th>
<th>5 Keypad Color</th>
<th>6 Backlight</th>
<th>7 Function Light Color</th>
<th>8 Un-illuminated Image Code</th>
<th>9 Network Type</th>
<th>10 Source Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**1 SERIES**
CKM Carling Keypad

**2 KEYPAD STYLING**
1 Standard

**3 BUTTON LAYOUT**
1 Two by Six

**4 ORIENTATION**
A Landscape C Reverse Landscape
B Portrait D Reverse Portrait
See “icon artwork button layout” section for details.

**5 KEYPAD COLOR**
1 Black

Ordering Scheme: Part 2 (Icon Artwork)

<table>
<thead>
<tr>
<th>Button 1</th>
<th>Button 2</th>
<th>Button 3</th>
<th>Button 4</th>
<th>Button 5</th>
<th>Button 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC</td>
<td>PA</td>
<td>PD</td>
<td>PE</td>
<td>UJ</td>
<td>WB</td>
</tr>
<tr>
<td>11 Function</td>
<td>13 Function</td>
<td>15 Function</td>
<td>17 Function</td>
<td>19 Function</td>
<td>21 Function</td>
</tr>
<tr>
<td>12 Icon Code</td>
<td>14 Icon Code</td>
<td>16 Icon Code</td>
<td>18 Icon Code</td>
<td>20 Icon Code</td>
<td>22 Icon Code</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Button 7</th>
<th>Button 8</th>
<th>Button 9</th>
<th>Button 10</th>
<th>Button 11</th>
<th>Button 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>YK</td>
<td>US</td>
<td>VU</td>
<td>U2</td>
<td>UR</td>
<td>TY</td>
</tr>
<tr>
<td>23 Function</td>
<td>25 Function</td>
<td>27 Function</td>
<td>29 Function</td>
<td>31 Function</td>
<td>33 Function</td>
</tr>
<tr>
<td>24 Icon Code</td>
<td>26 Icon Code</td>
<td>28 Icon Code</td>
<td>30 Icon Code</td>
<td>32 Icon Code</td>
<td>34 Icon Code</td>
</tr>
</tbody>
</table>

**FUNCTION LIGHT CODE** (Select for positions 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33)

- Landscape
- Reverse Portrait
- Reverse Landscape
- Portrait

3 Closed-Open-Closed
Additional function light colors available, please consult factory.

**ICON CODE**
00 For standard icons, see next page. For additional icons, please consult factory.

Continue to next page for layout and icons.
CKM-Series - Customizable Keypad - Icon Artwork Orientation & Codes

Orientation - Icon Artwork Button Number Layout
(see dimensional specifications for more detail)

A: Landscape

B: Reverse Landscape

C: Portrait

D: Reverse Portrait

Standard Icons Codes:

Standard Icon Codes continued on next page.
Dimensional Specifications: in. [mm]

Interface Adapter Cable: Deutsch to CAN (A3703)
Dimensional Specifications: in. [mm]
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